

**FIG. 1**  
(PRIOR ART)

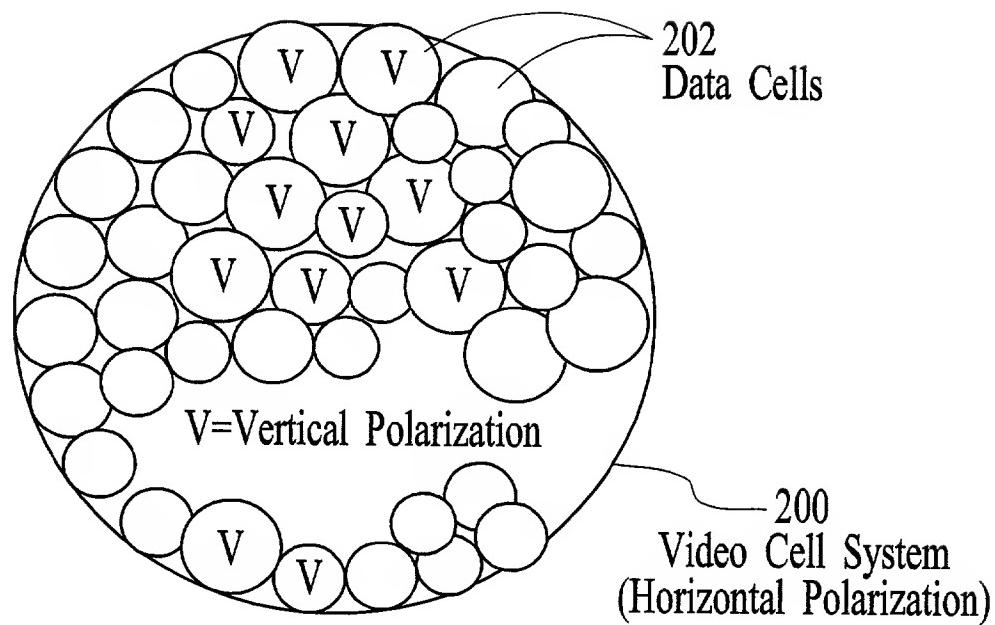


FIG. 2

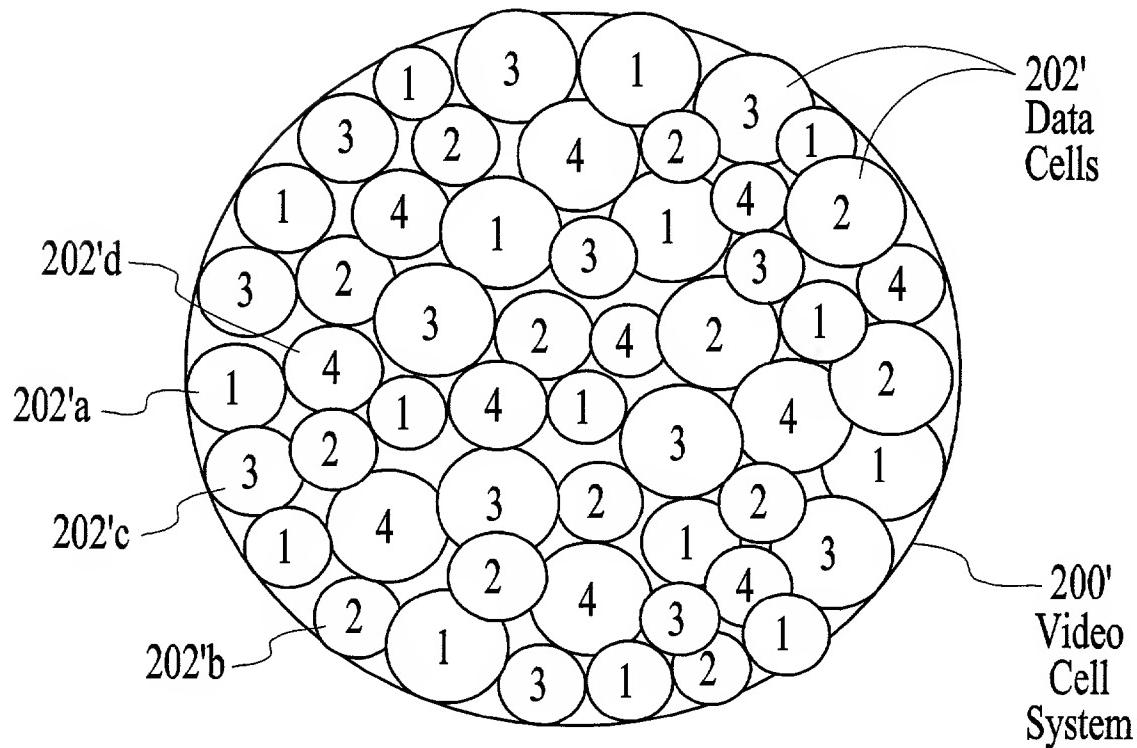


FIG. 3A

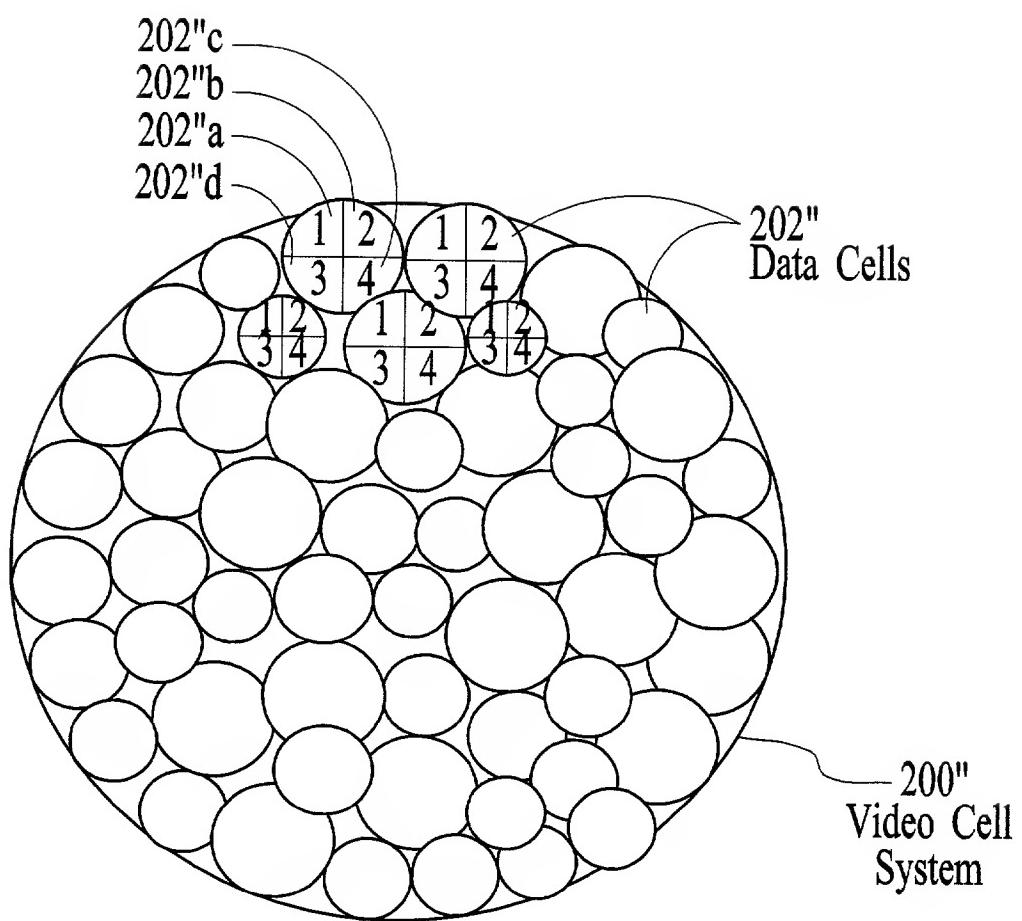


FIG. 3B

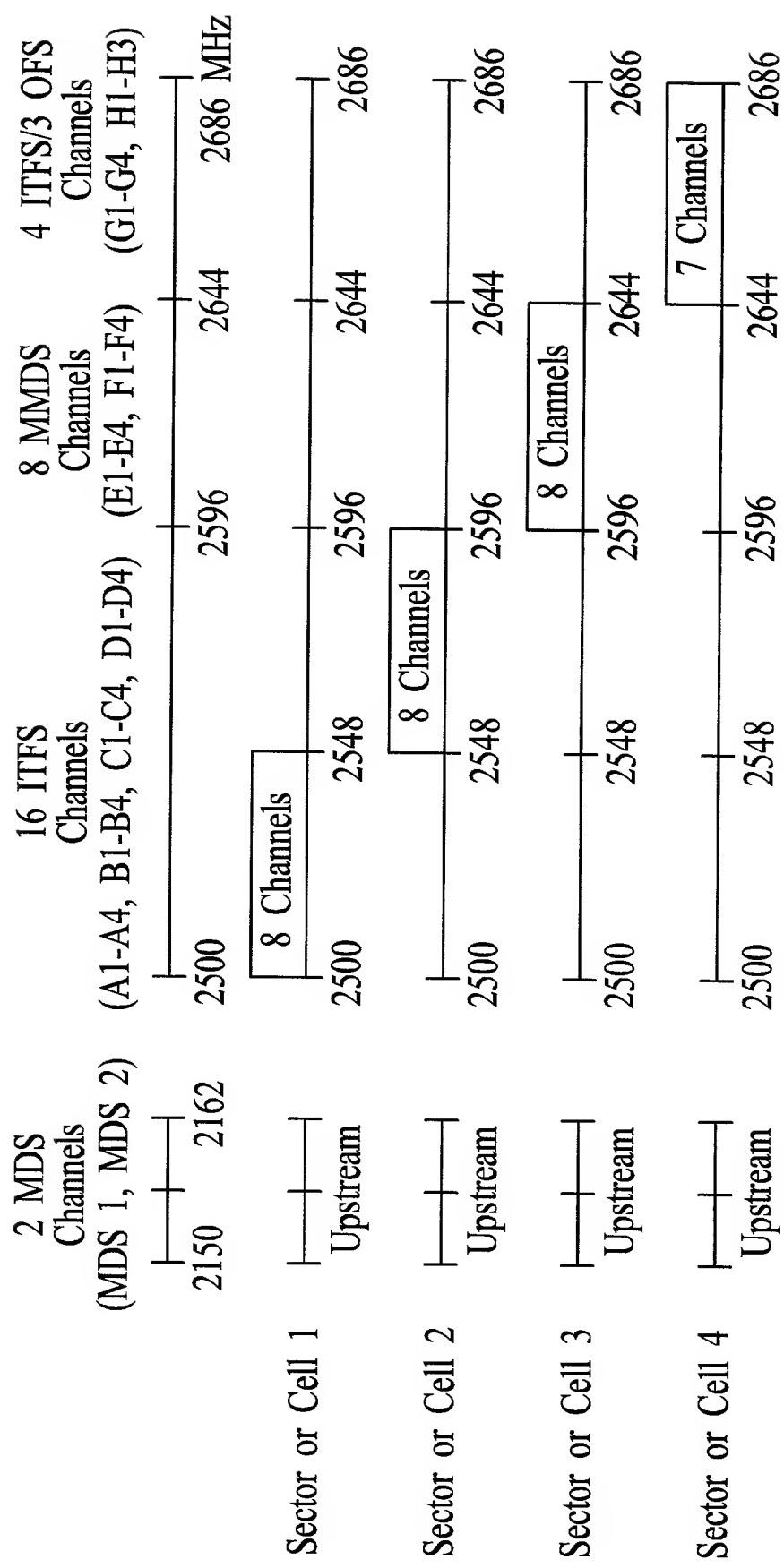


FIG. 4

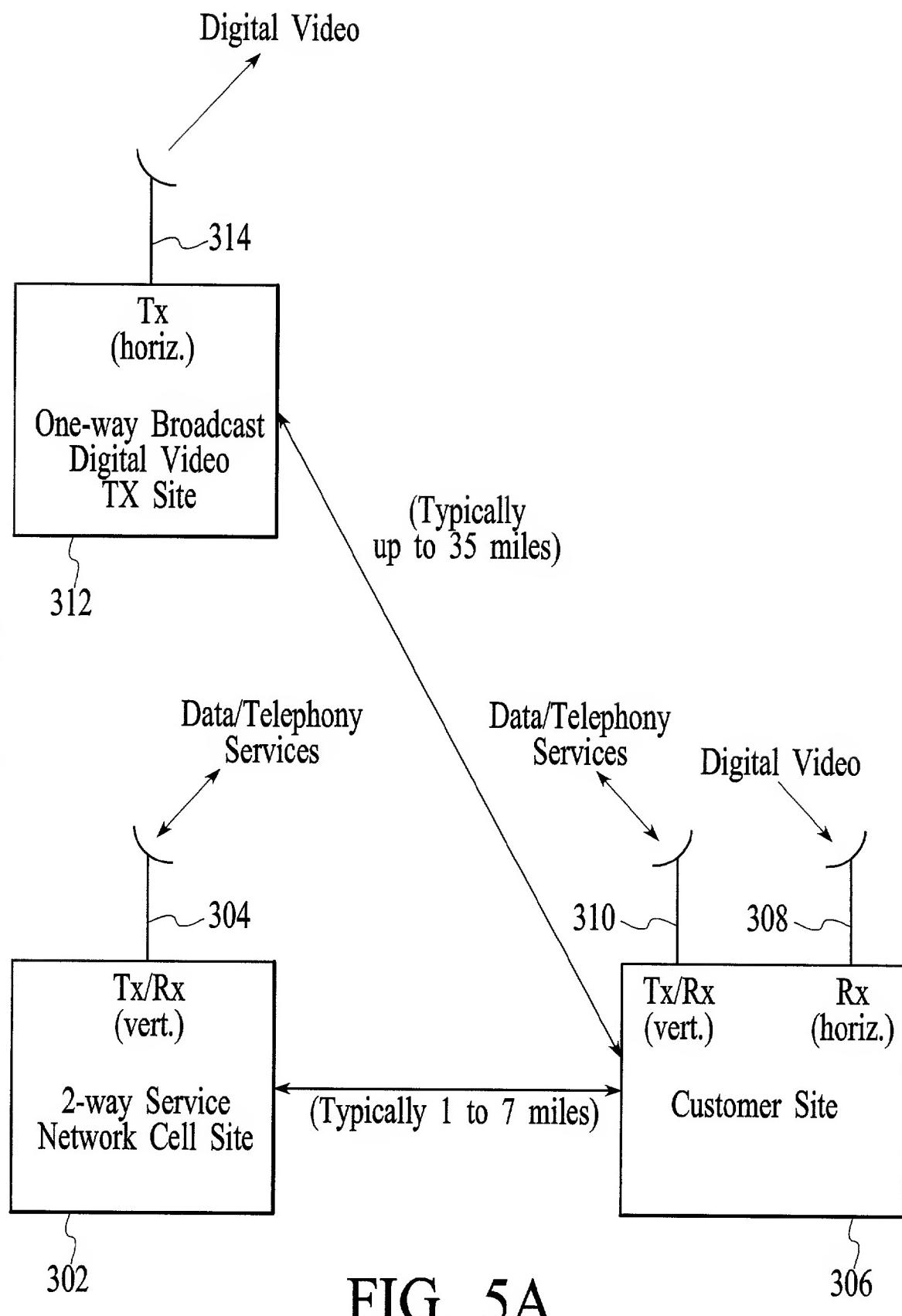


FIG. 5A

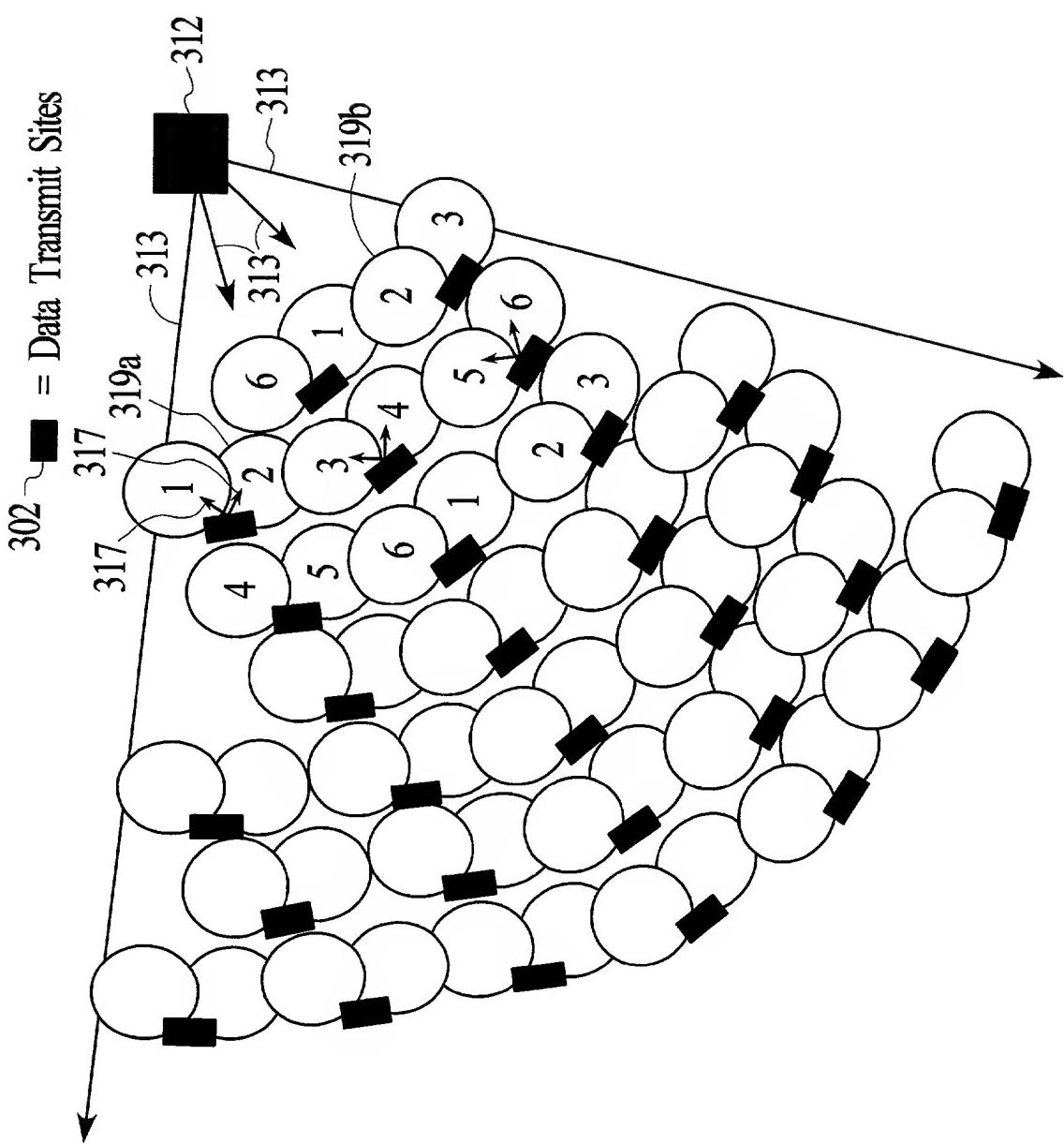


FIG. 5B

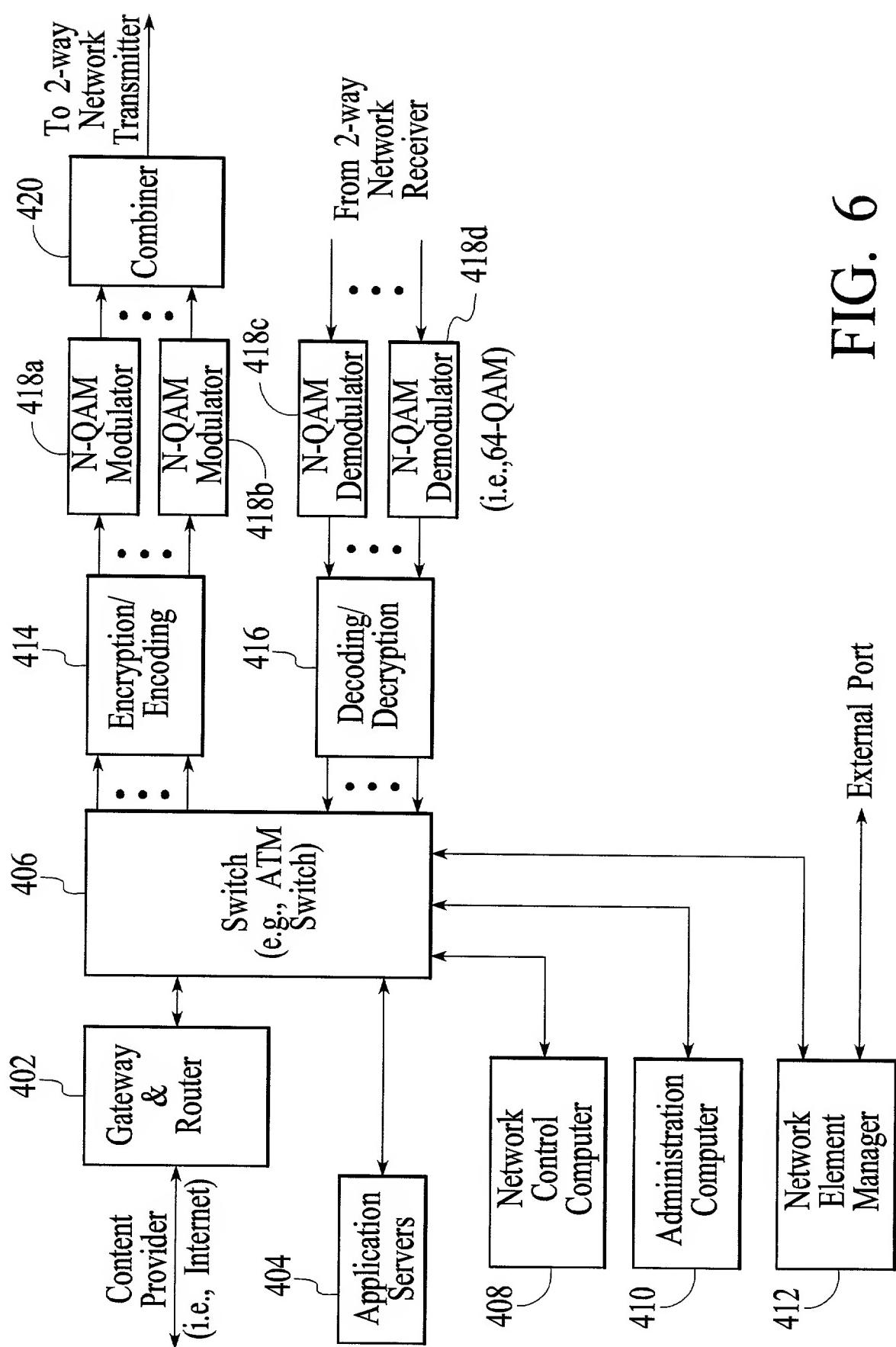


FIG. 6

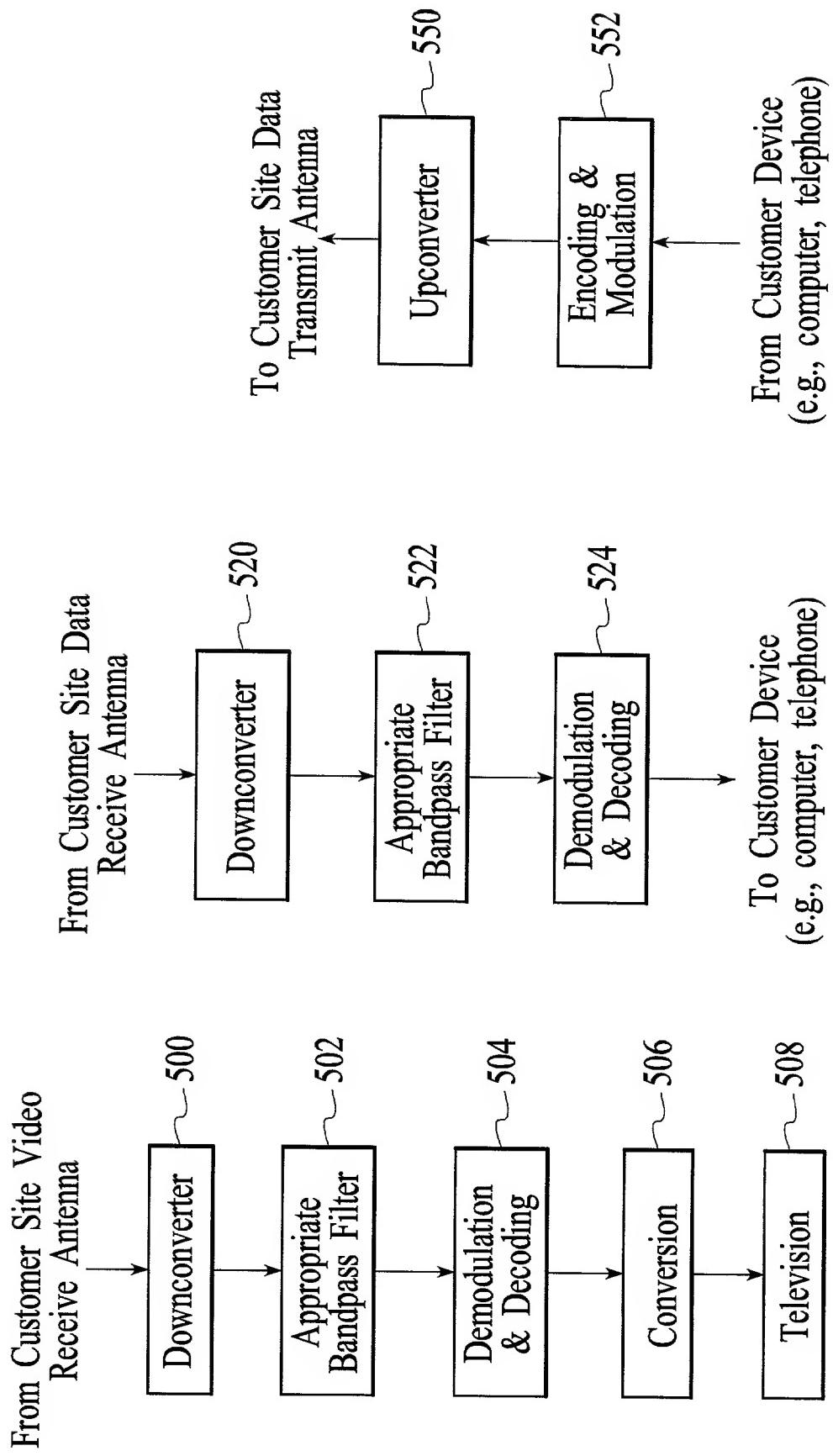


FIG. 7A

FIG. 7B

FIG. 7C

	Digital Video	2-way Service
Transmit Power (Average) per Channel:	47dBm	27 dBm
Transmit Antenna gain	+16 dBi	+10 dBi
Waveguide Loss	-4.0 dB	-1.0 dB
EIRP/channel	59.0 dBm	36 dBm
Free Space Loss	-134.70 dB (35 miles)	-117.80 (5 miles)
Miscellaneous loss (RFI, Grazing, Aiming, Rain)	-3.5 dB	-1.0 dB
Signal Level into Receive Antenna	-79.2 dBm	-82.8 dBm
Receive Antenna Gain	+21 dBi	+21 dBi
Signal Level into Downconverter	-58.2 dBm	-61.2 dBm
Downconverter Gain	+20 dB	+20 dB
Signal Level out of Downconverter	-38.2 dBm	-41.2 dBm
Noise floor (6 MHz)	-106 dBm	-106 dBm
Downconverter Gain	20 dB	20 dB
Downconverter Noise Figure (NF)	2.5 dB	2.5 dB
Noise level out of Downconverter	-83.5 dBm	-83.5 dBm
NF Contribution from modem/settop and cable loss	0.4 dB	0.4 dB
Cable loss	-3 dB	-3 dB
Noise level into Modem/Settop Receiver	-86.9 dBm	-86.9 dBm
Signal Level into Modem/Settop Receiver	-41.2 dBm	-44.2 dBm
S/N Ration into Modem/Settop Receiver	45.7 dB	42.7 dB
S/N Threshold of Demod w/RS FEC (64 QAM)	24.5 dB	24.5 dB
Available Margin	21.2 dB (@35 miles)	18.2 dB (@5 miles)
*Required Fade Margin (F) for 99.9% avail.	18.6 dB	NA
Extra Margin for 99.9% @ 35 miles	3.3 dB	18.2 dB

\* Based on the Bullington model:  $F = -10\log((1-\text{Avail.})/(2.5*a*b*f^2*D^3*10^{-6}))$ ;  
 a=1, b=0.25, f=(GHz), D=(miles)